Isokinetics and Exercise Science 13 (2005) 14–15
IOS Press

Abstract

Isokinetic assessment of complete proximal hamstring tendon rupture: Case reports

J.L. Croisier, V. Bartsch, M. Burnel and B. Zeevaert
Department of Physical Medicine and Rehabilitation, University of Liège, Belgium
E-mail: jlcroisier@ulg.ac.be

Complete hamstring tendon rupture is a rare clinical entity, reported particularly among water skiers [1]. The functional outcome seems uncertain and most authors recommend surgical repair of the injury [2,3]. In our work, we investigated two cases consisting of water skiing-related hamstring injury with a complete tendon rupture. Patient A (male, 47 years old) was non operatively treated and patient B (male, 33 years old) benefited from surgical repair one year after the injury. In both cases, the clinical diagnosis was confirmed by magnetic resonance imaging. No bony lesion from the ischium was observed after the injury and electromyographic examination excluded any motor recruitment abnormality.

The standardized isokinetic assessment included concentric measurements at 60°/s and 240°/s for both flexors and quadriceps. Afterward, flexor muscles were subjected to eccentric angular speeds of 30°/s and 120°/s. The resulting analysis consisted of bilateral comparison of peak torques permitting determination of asymmetries expressed in percentages and flexor/quadriceps (Fl/Q) ratios.

Patient A, managed with conservative treatment (classical physical therapy), still reported marked subjective complaints and disability on return to sports 5 months after the injury. The first isokinetic assessment took place at that time and revealed a major deficit of maximal strength (Fig. 1). He started an isokinetic strengthening program that was individually established on the basis of his own strength profile. After 20 training sessions, a second isokinetic testing did not show any improvement in performance, whatever the contraction mode.

After surgery, **patient B** was instructed by the surgeon to progressively perform peddling and swimming activities, but he was not allowed to receive any rehabilitation treatment! Due to a poor functional outcome, he was submitted 3 years postoperatively to a first isokinetic assessment that revealed a decrease in strength performance higher than 50% (Fig. 1). After a first period of isokinetic training (10 sessions) the peak torques (measured through a second isokinetic test) improved, mainly in concentric. By contrast, a second period of 15 training sessions did not allow any further recovery in strength. The residual deficit finally reached 29% in concentric (at 60°/s) and 48% in eccentric (at 30°/s).

Both patients were characterized by very low Fl/Q ratios meaning a persistent agonist/antagonist imbalance. These observations concur with the concept that non-operative treatment leads to profound impairment in strength and function among patients with complete proximal hamstring tendon rupture. Our follow-up also suggests that surgical repair does not systematically lead to a total recovery in muscle performance, particularly when the postoperative rehabilitation phase is neglected.

References

[1] Sallay et al., *Am J Sports Med* **24** (1996), 130–136.
[2] Cross et al., *Am J Sports Med* **26** (1998), 785–788.
[3] Klingele and Sallay, *Am J Sports Med* **30** (2002), 742–747.

ISSN 0959-3020/05/$17.00

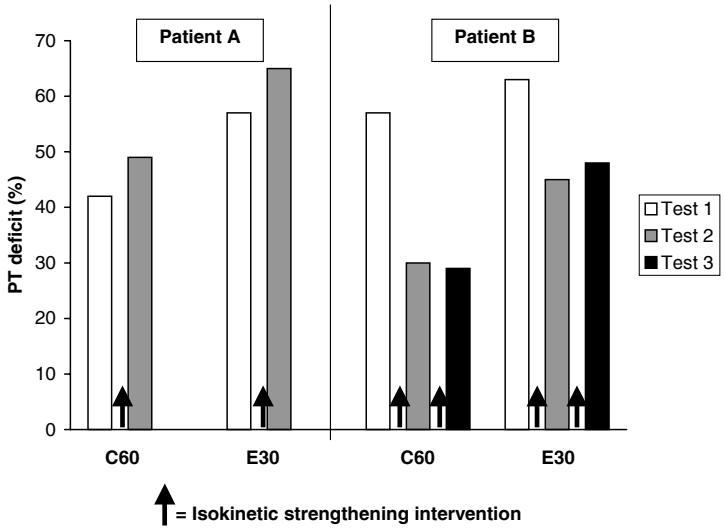

Fig. 1. Evolution of peak torque (PT) deficits (%) on injured muscles through successive isokinetic assessments. C60 = concentric at 60°/s; E30 = eccentric at 30°/s.